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Multilevel tree-based lookup table for acceleration of numerical calculations

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In the proces of numerical calculations, one often encounters situation, when some computationally expensive function is called multiple times for the same set of input parameters. Proper caching of alreasy obtained values can speed-up the calculations. In my work I concentrate on case, when function of multiple parameters needs to be cached. In order to be able to find requested values quickly, special multi-level tree structure was proposed and implemented. Further speed-up was obtained by allowing the use of OpenMP parallelization method which required revision of search and write algorithm in order to allow multiple tasks working simultaneously on the same tree-based caching structure.

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